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ABSTRACT

The use of contingent positive reinforcement and aversive procedures in reducing inappropriate behaviors in five autistic preschoolers was examined. Ss were reinforced for appropriate behaviors (including spontaneous eye contact and verbalizations, appropriate play, interaction, and direction following) and not reinforced for inappropriate behaviors (such as self stimulation, crying, echolalia, noncompliance, and aggression). Data were collected under four conditions in the clinic and under three conditions at home. Results revealed that treatment without aversives was inferior to results obtained with children who had received both reinforcement and contingent aversives early in treatment. A single spank on the thigh, bottom, or hand combined with a stern "no," used as a contingent aversive, resulted in rapid and dramatic decreases in five of the six targeted behaviors. Further, over a 4 to 6 month period, the suppressive effects of punishment were maintained, usually only with limited use of conditioned aversives. Findings suggested that contingent aversives may be an essential component of effective treatment for autistic children. Caution is advised to make sure that the environment provides opportunities for learning and reinforcement. (CL)

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THE ROLE OF AVERSIVE BEHAVIORAL INTERVENTIONS IN THE TREATMENT OF PRESCHOOL-AGED AUTISTIC CHILDREN: EFFECTS AND SIDE EFFECTS

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I. Introduction

A. The role of aversive behavioral interventions in the treatment of autistic and other developmentally disabled and disturbed children is of concern to both parents and professionals.

B. Our concerns usually center around our discomfort in imposing some sort of pain or unpleasantness on a child who has a particularly difficult time understanding what it is that we want.

C. Yet early in the history of Dr. Lovaas' research with autistic children, it was demonstrated that the usual compliment of reinforcers and punishers to which many children respond were of limited effectiveness with severely autistic children. In fact, at times, what were considered reinforcers in the form of attention, love, and affection often had an impact opposite to what was desired. So, for some children, attention to self-injurious behavior actually made the child worse.

D. It was in this early work when some effective intervention for severely self-destructive behavior was being sought that the role of contingent aversives in the form of electric shock were evaluated.

1. The data indicated that electric shock contingent upon self-injurious behavior resulted in very rapid and often in total suppression of these life threatening responses.
2. In addition, the data revealed that contingent aversives actually had some surprisingly positive side effects. These have been repeatedly demonstrated and reported on in the literature over the last 15 years and include:
   a. Increased eye to face contact and spontaneous verbalizations
   b. Increased attention to tasks
   c. Increased rate of learning
   d. Increase in compliance to requests and to task demands
   e. Decreased tantrumous and other avoidance motivated behaviors
3. The changes in affective and motivational behaviors were, therefore, quite dramatic relative to small and slow changes achieved with reinforcement based procedures. In some cases, the use of aversives was extended to efforts to establish people as meaningful reinforcers by associating them with the removal of the aversives - a positive reinforcer in most cases.
4. The results achieved with these children were far superior to those that had been previously reported, and so, when the Young Autism Project began, the use of contingent aversives was maintained as part of the treatment package. It is not surprising that aversives continued to be used, as this new, much younger population, did even better in response to treatment that included both contingent positive

reinforcers and contingent aversives.
   a. The young children learned more rapidly
   b. They demonstrated more substantial changes in affective and social behaviors
   c. They showed a more complete and lasting suppression of self-injurious, self-stimulatory, and oppositional behaviors.
   d. The long term outcome also seemed likely to be significantly different as the children began to enter preschool and public school placements.
5. These changes were achieved, in many cases, with only very time limited use of contingent aversives, and the use of a spank seemed to be as effective for these young children as electric shock had been for the older children.
6. But, at this point, the role of contingent positive reinforcers and the contribution, if any, made by contingent aversives, were confounded.

II. The Research
   A. The research that I will discuss examines the specific contribution of contingent aversives to the treatment of a group of preschool aged autistic children.
   B. This was a critically important piece of research, because by the time it was conducted with the last 5 children who participated in the Intensive Treatment I group, we had found that a very structured treatment program that included both contingent positive reinforcement and contingent aversives would produce very dramatic behavioral changes in a very short period of time. The significance of these rapid changes was that they permitted the child a chance to catch up. As already discussed, most of the children were 1 1/2 to 2 years behind their same aged peers in intellectual, social, and self-help skills.
   C. It was important to evaluate the specific contribution of contingent aversives to a treatment program that included tremendous commitments of time, personnel, caring, and positive reinforcers of the most creative kind.
   D. To do this, these 5 Treatment I children were seen for 40 or more hours per week of treatment in both the home and the clinic. Treatment consisted of the use of all available reinforcers for appropriate behaviors, including food, time out of the treatment situation, and favorite items. The kinds of behaviors targeted for change, and therefore for observation as part of this research, included spontaneous eye contact, spontaneous verbalizations, appropriate play, interacting with others, and following directions in both informal play situations and in more structured teaching situations.
   E. All of the inappropriate behaviors that frequently interfere with treatment efforts, such as self-stimulation, crying, whining and tantrumming, echolalia, noncompliance, and aggression were placed on extinction - that is, they were given no attention and an effort was made to limit their effectiveness in avoiding the treatment situation.
   F. The data for the study were collected under 4 conditions in the clinic where video tapes were used to preserve and score the data, and under 3 conditions at home, where in-vivo data collection occurred. Information on both behavior and on task

performance were collected. Behaviors were recorded as durations or frequencies and task performance as %correct.

1. In the clinic, the child was observed playing alone in the room where therapy sessions were conducted.

   The child also was observed playing with the therapist in the room, but with no reinforcers or contingent aversives in effect.

   The therapist then initiated an informal teaching situation, asking the child to move about the room, touch various objects, label objects, and answer simple questions. Here, reinforcement, extinction, and later, contingent aversives, were in use.

   Finally, a more structured teaching session with the child in the chair was conducted. The tasks included those emphasize early in treatment such as nonverbal and verbal imitation, labeling objects, and following simple directions. Again, reinforcers were used as was extinction, and later, contingent aversives.
2. It was important to us to evaluate the effectiveness of our procedures under a variety of conditions in order to evaluate both the direct effects and side effects of our interventions. We were also concerned with discrimination and generalization as past research had indicated that aversive interventions can be highly situation specific.
3. At home, the children were observed playing freely with the therapist present but not interacting, providing structure, or interacting.

   They were then observed in both informal and more structured teaching situations with reinforcers, extinction, or contingent aversives being used just as in the clinic situation discussed earlier.

III. Results

A. Contingent positive reinforcement and extinction were used with the 5 children for an average of 8 weeks. The shortest time was 3 weeks and the longest was 5 months.

B. The trends observed in both behavior and in task performance in response to treatment without aversives were clearly inferior to those that had been achieved with the children who had received both reinforcement and contingent aversives early in treatment.

   1. Large classes of inappropriate behaviors remained high rate
      a. Self-stimulation averaged about 30% of the total treatment session time, while tantrums took up 10% of session time. The children were noncompliant 50% of the time on tasks and requests that they had demonstrated mastery of on some occassions.
      b. So, you can see that valuable time was being wasted in every treatment session.
      c. In addition, while the children did show some evidence of new learning in the areas of play, language, and other academic type tasks, the individual data reveal that the children's performance was extremely variable, their

responses unpredictable, and the rate of acquisition of new information and new responses was slower than achieved with children for whom contingent aversives were part of treatment from the very outset.

C. These data, in each case, supported the need for some more effective interventions for reducing self-stimulatory, tantrumous, and oppositional behaviors and for making people more meaningful agents of behavior change.
   1. The reason that extinction and working through are often ineffective is that they can be impossible to achieve. It is unrealistic to ask a concerned parent or adult to ignore one child aggressing against another, property being destroyed, or a child inflicting injury on himself. In addition, self-stimulatory behaviors do not respond to extinction since they are self-reinforcing in nature. Extinction is also a painfully slow process, and in some cases can, therefore, be life threatening.
   2. As a part of our previous work with young autistic children, we had found that one of the most effective contingent aversives we could use was a single spank on the thigh, bottom, or hand combined with a stern "no".
      a. Such an aversive can be delivered immediately, contingent upon an inappropriate behavior.
      b. It does not require very complex cognitive abilities on the part of the child.
      c. A spank has the ability to compete with self-stimulatory and avoidance motivated behavior.
      d. A spank also has the advantage of being portable and relatively nondiscriminable; it approximates the real world in that many parents use a few well timed spankings in the course of child rearing, and this sort of intervention was found to be manageable by parents and therapists under close professional supervision.
      e. Most importantly, spank and stern "no" were powerful enough to permit the establishment of conditioned aversives such as the word "no", a displeased facial expression, and the withdrawal of adult attention.
   3. In each case, the data were carefully examined by the treatment team, including the parents, and the most disruptive or upsetting inappropriate behavior was targeted for contingent aversive intervention. The aversives were always begun in the clinic until the desired reduction or suppression was achieved - or until the intervention was deemed ineffective. Sequential introduction of contingent aversives continued until all inappropriate behaviors that were showing no change in response to positive interventions were addressed.
   4. Figure A indicates that the introduction of contingent aversives produced similar and highly successful results for all of the children.
      a. Rapid and dramatic decreases occurred in 5 of the 6 behaviors that were the focus of contingent aversives.
      b. Self-stimulation decreased from 30% to 2%, noncompliance from 50% to 8%. Tantrums showeda similar decrease as did ritualistic and psychotic-like behaviors.
      c. In addition, looking at the upper grid in Figure A, which represents clinic conditions where no contingencies were in effect, demonstrates that for this group of

children, the suppressive effects of punishment generalized to conditions that were similar but where contingent positive reinforcement and contingent punishment were not being used.

d. Also noteworthy was that only a few responses had to be punished for any child, the most being 3. Most common were self-stimulation, noncompliance, and another avoidance behavior such as tantrums or lining. Suppression was achieved within 2 weeks for each of the behaviors after which only infrequent pairings of a spank were sufficient to maintain conditioned aversives effective in suppressing behaviors.

e. This limited time during which the frequent and intensive use of aversives is in effect is important to note because often times self-injurious, self-stimulatory, and tantrumous behaviors become the focus of years of treatment with limited progress achieved in other critical domains such as peer relations, play, and language. To us, time had become a critical variable because of the significant treatment gains made by previously treated children.

5. Figure B provides a summary of the information gathered regarding the side effects of our addition of contingent aversives to the treatment package.
   a. The side effects varied for each child and suggested the importance of careful monitoring and individualized assessment.
   b. Generally, behaviors where a decrease was desired, such as self-stim. and tantrums, changed little as a result of contingent aversives for other behaviors. This speaks to the limited generalization of effects across behaviors and to the persistence of these behaviors in the children's repertoires.
   c. On the other hand, spontaneous eye contact, spontaneous verbalizations, compliance, and task performance improved without any change in the reinforcement conditions.
   d. Interacting, play, and other prosocial responses continued to require specific attention, but contingent aversives clearly facilitated these behaviors in a way that contingent positive reinforcement and shaping could not.
   e. This relates to more theoretical issues of motivational defects in autistic and other disturbed individuals in response to positive reinforcement and to social behaviors.
6. Over the 4-6 month period that each child was closely followed (data collected 3-5 times per week), the suppressive effects of punishment were maintained, generally with only limited use of conditioned aversives. In addition, more normalized contingencies, like loss of free time and desired objects, became useful.
   a. All of the children continued to make gains in play, social behaviors, language, and cognitive skills. This is, at least in part, because once inappropriate behaviors are reduced, the larger social environment has an opportunity to reinforce more appropriate behaviors as they emerge.
   b. Within 6 months to one year of the initiation of treatment, all of the children had been enrolled in preschool programs.
   c. Those children followed up again at one year showed continued increases in the quality and quantity of inter-

actions, play, and the spontaneous use of language as well as in cognitive abilities. All inappropriate behaviors, both punished and unpunished, remained low rate or zero.

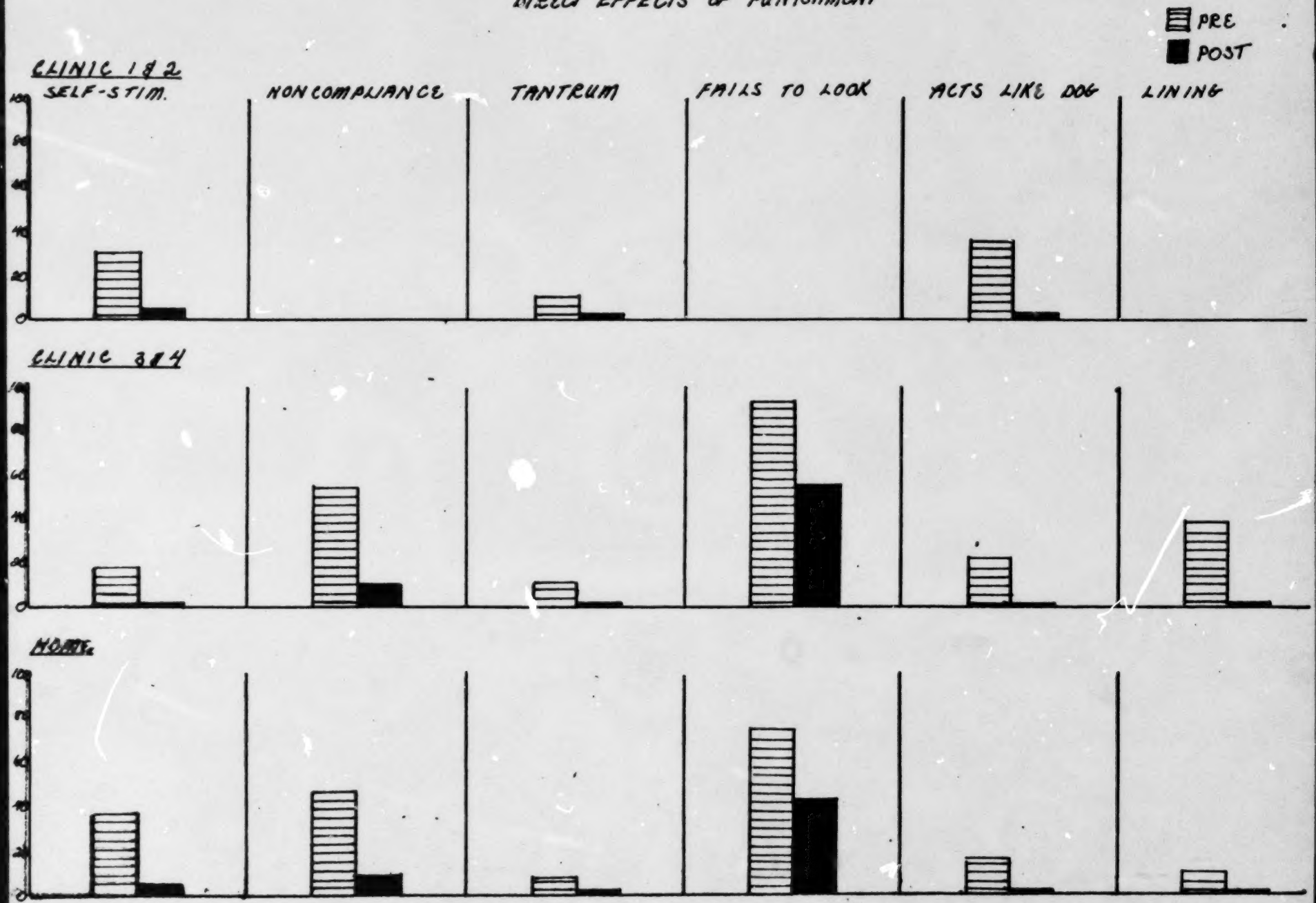
IV. Conclusions

A. The Young Autism Project data indicate that despite an early, intensive, and heavily loving, positive, and patient approach, contingent aversives are necessary if a significant and rapid reduction in interfering behaviors is to be achieved so that critical learning can occur.

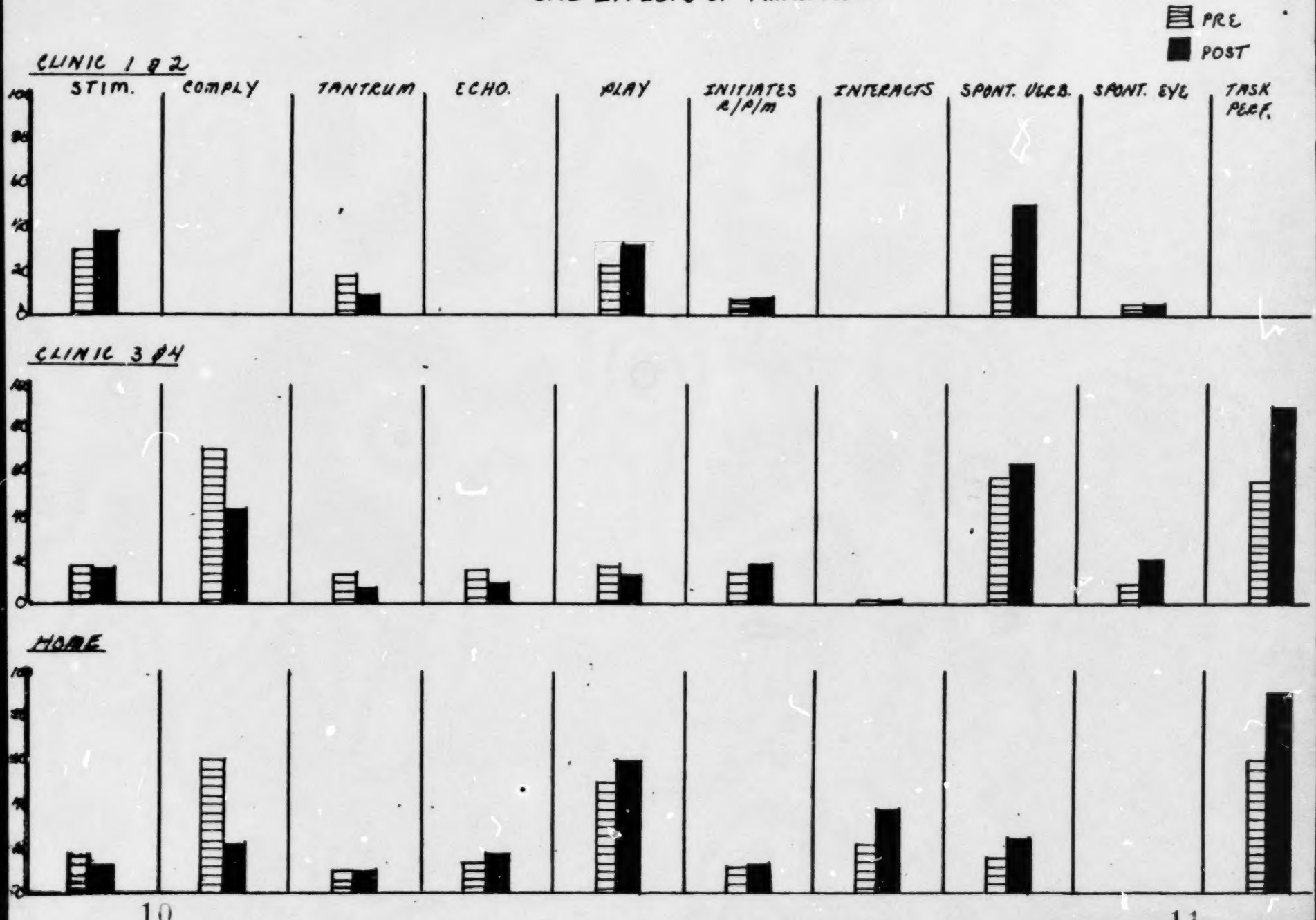
B. This suggests that contingent aversives may be an essential component of maximally effective treatment and may define the least restrictive alternative to treatment for this group of children. That is, if contingent aversives keep children out of institutional settings and permit them to function in school, home, and community, then it may be unethical to withhold this form of intervention because of personal biases.

C. Most important, however, is contingent aversives can never be used in the absence of a program that is rich in opportunities for learning and for reinforcement, and that provide safety, love, and support. These components are essential to any good program and to any intervention plan that is to be successful, but they are especially critical when reductive interventions are planned. It is essential to determine that inappropriate behaviors are not being supported by the absence of stimulation in the setting or by the lack of skilled people in it. Reductive programs are only of value if the environment and the people in it are capable of shaping and responding to more appropriate behaviors in place of the inappropriate ones.

SUMMARY FIGURE A
DIRECT EFFECTS OF PUNISHMENT



SUMMARY FIGURE B
SIDE EFFECTS OF PUNISHMENT



Observation Conditions

CLINIC

Condition I (Play alone)
- No therapist present
- No contingencies in effect
- Behavioral data

Condition II (Noninteracting Therapist Present)
- Therapist present
- No contingencies in effect
- Behavioral data

Condition III (Interacting Therapist Present, Out-of-Chair Task Demands)
- Therapist present
- Positive and negative contingencies in effect
- Behavioral and task performance data

Condition IV (Interacting Therapist Present, In-Chair Task Demands)
- Therapist present
- Positive and negative contingencies in effect
- Behavioral and task performance data

HOME

Condition I (Behavioral Observation)
- Therapist present
- Positive and negative contingencies in effect
- Behavioral data

Condition II (Out-of-Chair Task Demands)
- Therapist present
- Positive and negative contingencies in effect
- Task performance data

Condition III (In-Chair Task Demands)
- Therapist present
- Positive and negative contingencies in effect
- Task performance data